

PRECIPITATION.

Map No. III graphically shows the month's rain-fall and melted snow. The table in the left-hand corner exhibits the numerical deficiencies and excess.

RELATIVE HUMIDITY.

The relative humidity for the month averages as follows in the various districts: New England, .69; Middle Atlantic States, .66; South Atlantic States, .70; Gulf coast, .74; interior of Gulf States, Lower Mississippi and Ohio valleys, .66; Missouri valley, .61; Lake region, .69, and Minnesota, .77.

PREVAILING WINDS.

As will be seen from Map No. II, the predominant winds were N. W. and N., except west of the lower Mississippi valley, where they were S. E. Some of the maximum movements of wind for the month were as follows: At Alpena, 7,453 miles; Buffalo, 8,136 miles; Cheyenne, 9,215 miles; Cleveland, 8,788 miles; Erie, 10,720 miles; Indianola, 9,097 miles; Sandy Hook, 11,058 miles. Some of the minimum movements were: At Augusta, 2,919 miles; Lynchburg, 2,226 miles; Baltimore, 3,015 miles.

NAVIGATION.

The river-stages are shown by the tabular statement on Map No. III. The heavy rains which occurred from the 22d to the 24th, raised the Ohio and its tributaries from Pittsburgh to Cairo, and also raised the Cumberland and Tennessee, which subsequently affected the Mississippi.

TEMPERATURE OF WATER.

The temperatures of the water, from observations taken at the bottom, are exhibited in the table, on Map No. II.

ATMOSPHERIC ELECTRICITY.

(1.) *Thunder and Lightning*.—There is a marked falling off in this element since October, although it was abundant during the great storm, No. VIII. (See p. 4.) Lightning and thunder occurred at Duluth on the 7th; at Fort Gibson, Indian Territory, on the 6th; at Nashville on the 10th.

(2.) Scarcely any brilliant *auroral* displays were reported for November, which is in very marked contrast with the October record. One brilliant aurora was seen at Trenton, N. J., 27th.

OPTICAL PHENOMENA.

This element of the November meteorology is of special interest, especially if studied in connection with the great cyclone of the 21st to 23d.

(1.) *Solar halos* were reported at Cornish, Me., on the 1st and 8th; at West Charlotte, Vt., on the 3d; at Florida, Mass., on the 5th; at Toledo on the 15th and 19th; Plattsburg Barracks and Troy, N. Y., on the 16th; Troy on the 19th; at Havana, Ill., on the 10th, 13th and 18th; at Carthage, Ohio, on the 14th and 30th; at Cresco, Iowa, on the 20th and 24th; at Atlanta and Gainesville, Ga., Hennepin, Ill., Rocky Run and Utica, Wis., and Dunbarton, N. H., on the 24th; and at Savannah on the 22d.

(2.) *Lunar halos* were observed at Afton and Mt. Vernon, Iowa, on the 15th; at Wilsonville, Ala., Cornish and Standish, Me., North Adams, Mass., Wilmington, N. C., Falsington, Pa., West Charlotte, Vt., on the 16th; at Havana, Ill., Cresco, Iowa, Rocky Run and Utica, Wis., on the 18th; at West Point, Brook Haven and New York City, N. Y., Southington, Conn., Andover and Fall River, Mass., Atco and Freehold, N. J., Falsington, Ephrata, Williamsport, Reading and Tioga, Pa., on the 19th; at Havana, Ill., Afton, Iowa, Freehold, N. J., and New York City, on the 20th; at Atlanta, Ga., Hennepin and Havana, Ill., Standish, Me., Litchfordville and Hudson, Mich., Trenton, N. J., Wilmington, N. C., Carthagen and Mt. Auburn, Ohio, on the 21st; at Dunbarton, N. H., and Lunenburg, Vt., on the 22d; at Auburn, N. H., on the 23d; at Litchfordville, Mich., on the 24th; at Gardiner, Me., and Woodstock, Vt., on the 27th; and again at Woodstock, Vt., on the 28th and 30th.

At Long Branch a *lunar halo* was visible from the 19th till 2 a. m. of the 20th; one was seen at Santa Fé on the 17th; at Erie, Penn., on the 27th; at Breckinridge, Minn., on the 24th; at Augusta, Ga., on the 24th; at Eastport, Me., on the 21st, one of great diameter; one at Knoxville on the 24th, with a lunar cross; on the 21st, one of exceeding brilliance at Lexington, Ky.; a large *halo* at Milwaukee, on the 20th; at Morgantown, W. Va., on the 16th 19th and 21st, (with a radius of 22°); at Rochester, on the 27th; at New York and New Haven on the 19th; and a *lunar corona* at Fort Gibson, Indian Territory, on the 22d.

The lunar halos, both on account of their number and intensity, are of special interest in connection with the cyclone of the 21st to 23d.

CAUTIONARY SIGNALS.

During the month of November there were displayed at the United States ports, maritime and inland, seventy-five storm-warnings, and, at Canadian ports, forty-two. The resulting weather shows that, of the seventy-five warnings displayed at United States ports, sixty were fully justified, and three were partly justified. This gives (as the percentage of perfect justification) *eighty per cent.* Most of these warning-signals were of great value to shipping, as shown by the journals and public press. A Milwaukee paper, speaking of the small number of disasters from the great gale of the 23d, says: "This is undoubtedly due to the Cautionary Signal which kept vessels in port." The signal was hoisted here nine hours before the storm began, and not a single vessel left port during the display, and several owners and captains afterwards stated that their cargoes and vessels were saved by obedience to the signal. The insurance companies refused to take risks on any vessel disobeying the signal. All along the Lakes, the benefit of the warnings was largely and most favorably commented upon.

MISCELLANEOUS PHENOMENA.

(1.) *Forest fires, &c.*—There were not many forest or prairie fires, but the extensive conflagrations of October, owing to the lateness of the season and the arrival of the fall rains, were mostly extinguished early in November. About the 6th of the month, a few fires, in the Piedmont region of Virginia, were put out by rain. Fires were burning in the woods near Urbana, Ohio, on the 3d, and much smoke overspread Charleston, S. C., on the 2nd, 3d and 4th. Prairie fires were reported from Cave Spring, Missouri, on the 10th and 11th. Large prairie fires to the east of North Platte, Nebraska, were observed on the 1st of November. No other noteworthy conflagrations were registered.